

PB89-189534

Superfund Record of Decision (EPA Region 5)
Petersen Sand and Gravel Site, Libertyville, Illinois
(First Remedial Action), September 1988

(U.S.) Environmental Protection Agency, Washington, DC

Sep 88



U.S. Department of Commerce
National Technical Information Service

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PB89-189534



Superfund Record of Decision:

Petersen Sand & Gravel, IL

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4. Title and Subtitle SUPERFUND RECORD OF DECISION Petersen Sand & Gravel, IL First Remedial Action - Final			5. Report Date 09/14/88
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15. Supplementary Notes			11. Contract(C) or Grant(G) No. (C) (G)
			13. Type of Report & Period Covered 800/000
			14.
16. Abstract (Limit: 200 words) Petersen Sand and Gravel (PSG) is a 20-acre mining site and a former disposal area located north of Libertyville, Illinois. The site is part of a tract of land owned since 1979 by the Lake County Forest Preserve District (LCFPD). PSG is bordered by the Des Plaines River to the west, forest preserve land and residences to the east, and agricultural land and small business to the north and south. The site consists of three disposal areas, including a three- to four-acre landfilled area reportedly containing construction debris, trees and tires; an area that contained 400 to 500 55-gallon drums of paint and solvent wastes; and an area that contained approximately 500 drums of solvents and 1,000 paint cans. The entire site is approximately 20 feet below the elevation of the Des Plaines River due to mining operations which are still continuing and are expected to continue until the early 1990s. LCFPD is planning to construct a recreational lake at the site when mining operations cease. Raymond Petersen purchased the property in 1952, which included a 30-acre parcel east, and a 20-acre parcel west of the river, and began the sand and gravel operations at the site later that year. Between 1955 and 1958, unknown refuse was disposed of in the four-acre landfill. In 1971 the Illinois Environmental Protection Agency (IEPA) investigated reports of illegal dumping and subsequently ordered immediate closure of the site. In 1973, the Illinois (See Attached Sheet)			
17. Document Analysis a. Descriptors Record of Decision Petersen Sand & Gravel, IL First Remedial Action - Final Contaminated Media: none Key Contaminants: none b. Identifiers/Open-Ended Terms c. COSATI Field/Group			
Availability Statement		19. Security Class (This Report) None	21. No. of Pages 38
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16. ABSTRACT (continued)

- Pollution Control Board ordered complete waste removal and covering of the refuse. Additional reports cited that numerous drums were not removed. These wastes, consisting of 55-gallon drums of paint and solvent waste, were removed in 1977. An inspection conducted in 1980 detected no additional buried drums. The Lake County Grading Company (LCGC) took over the mining operations in 1983, and discovered additional buried drums of solvents and paint cans. These containers were removed from the area that year, along with contaminated soil. In 1984, the site was placed on the National Priorities List. A 20-acre area in the northwest corner of the site was the focus of concern. The final remedial investigation report conducted by IEPA was completed in April 1988, indicating no presence of contaminants at levels of concern, thus a feasibility study was not necessary. The investigation analyzed over 150 organic and inorganic compounds, and only manganese and iron exceeded secondary MCLs.

↳ manganese

The selected remedial action for this site is no further action, since the findings in the RI indicated that previous removal actions were adequate and that no unacceptable risk remained on site. However, a lake will be constructed onsite, therefore, surface water and sediment monitoring is recommended both before and after the lake is in place. Ground water and precipitation collected in the mining pits will continue to be discharged to the Des Plaines River in compliance with the NPDES permit until the mining operations cease. There are no capital or O&M costs associated with this remedial action.

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Petersen Sand and Gravel Site, Libertyville, Illinois

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial alternative for the Petersen Sand and Gravel (PSG) site developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 and consistent with the National Oil and Hazardous Substances Pollution Contingency Plan to the extent practicable.

This decision is based upon the contents of the Administrative Record for the PSG site.

The State of Illinois concurs with the selected remedial alternative.

DESCRIPTION OF THE REMEDY

The results of the Remedial Investigation (RI) show that the previous removal actions were adequate to protect human health and the environment, and that no unacceptable risk remains at the site. Therefore, the selected remedy for this site is "No Further Action".

The site owner, Lake County Forest Preserve District (LCFPD), intends to construct a recreational lake in the sand and gravel pit, which will flood the site area. Although the RI report, Endangerment Assessment, concluded that development of the lake should not pose any unacceptable risks, it is impossible to fully predict future conditions if a lake were developed. In order to ensure the safety of future users of the lake and aquatic life, the Agency has recommended to Lake County that, at a minimum, surface water be monitored before and after the lake is constructed.

DECLARATION

The selected remedy is protective of human health and the environment and attains Federal and State requirements that are applicable or relevant and appropriate to this site. The statutory preferences for cost-effectiveness, permanent solutions and alternative treatment technologies are not applicable to the "No Further Action remedy". Because this remedy will not result in hazardous substances remaining on-site above health-based levels, the 5-year review will not apply to this action.

Date

9/14/88

Valdas V. Adamkus
Regional Administrator

- Attachments: 1) Summary of Remedial Alternative
2) Community Relations Responsiveness Summary
3) Administrative Record Index



217/782-6761

Refer to: L0978090001 -- Lake County
Petersen Sand and Gravel -- Libertyville
Compliance

August 4, 1988

STATE OF ILLINOIS - RECORD OF DECISION

Site Name and Location

Petersen Sand and Gravel
Libertyville, Illinois

Statement of Basis and Purpose

This decision document represents the State of Illinois' decision, through the Illinois Environmental Protection Agency, to select the remedial action as outlined in the Record of Decision and the Declaration for the Record of Decision issued in connection with the above-captioned matter. The selected remedial action for the above reference site was developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Control Act (NCP). The attached Index identifies the documents which comprise the administrative record upon which the selection of the remedial alternative is based.

Description of the Remedy

The findings of the Remedial Investigation (RI) show that the previous removal actions were adequate to protect human health and the environment, and that no unacceptable risk remains at the site. Therefore, no further remedial action will be done at the site.

The site owner, Lake County Forest Preserve District (LCFPD), intends to construct a recreational lake in the sand and gravel pit which will flood the site area. Although the RI report Endangerment Assessment concluded that development of the lake should not pose any unacceptable risks, it is impossible to fully predict future conditions if a lake were developed. In order to ensure the safety of future users of the lake and aquatic life, the Agency has recommended to Lake County that at a minimum surface water be monitored before and after the lake is constructed.



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Declaration

The selected remedy is protective of human health and the environment, and attains Federal and State requirements that are applicable or relevant and appropriate (ARARs). Cost effectiveness and utilization of permanent solutions and alternative treatment technologies are not applicable to the no further action alternative.

Because this remedy will not result in hazardous substances remaining on-site above health-based levels, a review will not be conducted within five years (as mandated by CERCLA and SARA) after commencement of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

8/10/88

Date

Bernard P. Killian

Director

Illinois Environmental Protection Agency

JL/jab/1824j/42-43

Attachment: Administrative Record Index



INDEX OF THE ADMINISTRATIVE RECORD

- . Preliminary Assessment Report (PA)
- . Site Investigation Report (SI)
- . Removal Documents (Chemical Waste Management report)
- . QA/QC Data from Laboratory (at IEPA, LPC files)
- . Data Summary Sheets (Refer to Remedial Investigation)
- . Health and Safety Plan
- . Quality Assurance Project Plan (QAPP)
- . RI/FS Work Plan
- . Summary of changes to Work Plan
- . Changes in Scope of Work (Memos)
- . Remedial Investigation (RI)
- . Community Relations Plan
- . PRP Search Document
- . Response to Public Comment - Responsiveness Summary
- . Transcript of Public Meeting
- . Record of Decision (ROD)
- . Amendments to ROD (if applicable)
- . Pollution Control Board Opinion and Order
- . Court Order

JL/jab/1824j/44

ATTACHMENT I

PETERSEN SAND AND GRAVEL SITE
LIBERTYVILLE, ILLINOIS

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION
JULY 1988

Site Name, Location and Description

The Petersen Sand and Gravel pit is located north of Libertyville, Illinois; northeast of the intersection of routes 21 and 137 with the main entrance from route 137 (see Figure 1). The pit, as well as land to the west and some land to the east, is owned by Lake County Forest Preserve District (LCFPD). The pit is mostly fenced and is bordered by the Des Plaines river to the west; by route 137 to the south; by River Road, forest preserve land and residences to the east and by agricultural land and small businesses to the north. An area of about 20 acres in the northwest corner of the pit was the focus of the Remedial Investigation. This area was used for the disposal of miscellaneous debris and hazardous materials including paint, paint waste and solvents. Disposal activities have primarily occurred at three locations:

- 1) Disposal Area 1 (DA-1) is a 3-4 acre landfilled area which reportedly contains construction debris, trees, tires etc.
- 2) Disposal Area 2 (DA-2) contained 400-500 fifty five gallon drums of paint and solvent wastes which were removed in 1977.
- 3) Disposal Area 3 (DA-3) contained approximately 500 drums of solvents and 1000 paint cans which were removed in 1983.

Sand and gravel mining has left the base of the pit approximately 20 feet below the elevation of the adjacent Des Plaines River. Mining operations are continuing with completion expected in the early 1990's. At this time, LCFPD plans to construct a recreational lake in the sand and gravel pit which will flood the site area (see Figure 2).

Nearby populations include residents to the east of River Road within a half mile of the site and south of route 137 within three fourths mile of the site. A mobile trailer on the west edge of the site is used as a residence. Libertyville township is located approximately 1.5 miles south of the site. Approximately 15 private wells east of the Des Plaines River within 1 mile of the site draw groundwater from the upper outwash aquifer.

Site History and Enforcement Activities

In 1952, Raymond Petersen purchased approximately 30 acres of land west, and 20 acres of land east of the Des Plaines River. Later that same year, Mr. Petersen began sand and gravel operations on both parcels of property. Operations on the west side were abandoned in 1960.

Between 1955 and 1958, Mr. Petersen started allowing dumping of refuse in a 3 to 4 acre worked-out portion of the gravel pit on the east side of the river. The refuse supposedly consisted primarily of construction debris, trees, tires, and other nonhazardous materials. It is unknown when Mr. Petersen began accepting hazardous materials such as paint, paint waste, and solvents at the site.

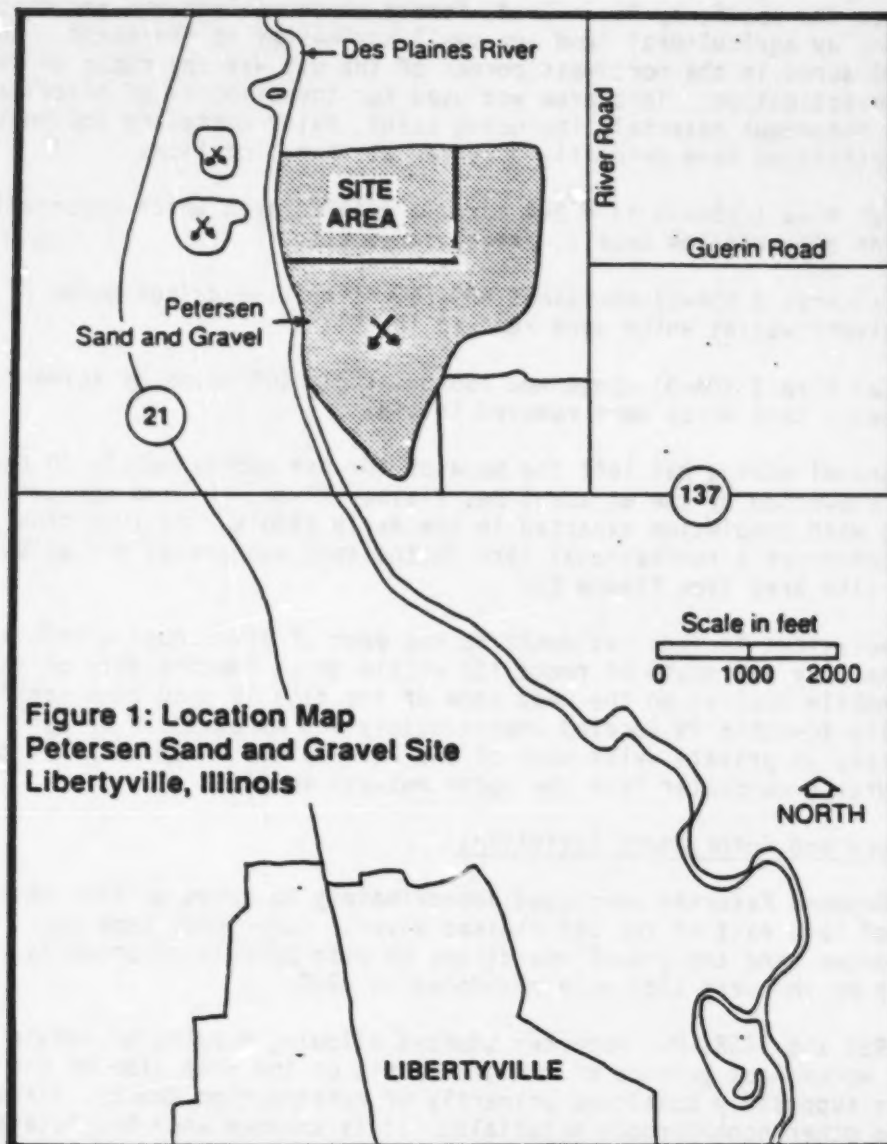
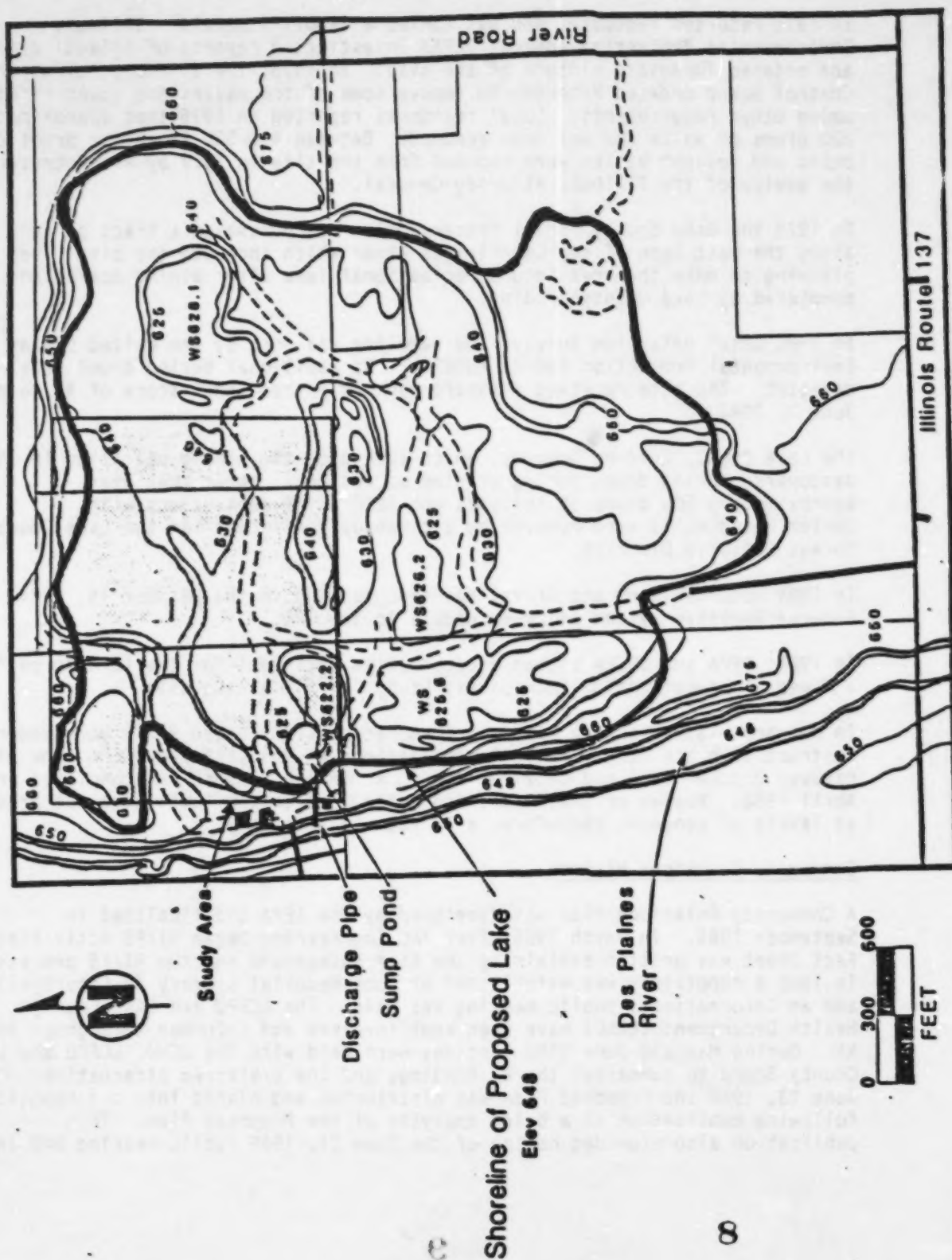


Figure 2 Proposed Lake Location
Source: PRC RI (4/4/88)



In 1971 Petersen requested and was denied a landfill permit. Illinois Environmental Protection Agency (IEPA) investigated reports of illegal dumping and ordered immediate closure of the site. In 1973, the Illinois Pollution Control Board ordered Petersen to remove some of the wastes and cover refuse, among other requirements. Local residents reported in 1976 that approximately 500 drums of waste had not been removed. Between 400-500 55 gallon drums of paint and solvent wastes were removed from the site in 1977 by Mr. Petersen at the advice of the Illinois Attorney General.

In 1979 the Lake County Forest Preserve District purchased a tract of land along the east bank of the Des Plaines River which included the pit. They are planning to make the area into a recreational lake after mining operations are completed by Lake County Grading.

In 1980 metal detection surveys and sampling was done by the United States Environmental Protection Agency (USEPA). No additional buried drums were detected. The site received a Hazard Ranking System (HRS) score of 44.16 on June 1, 1983.

The Lake County Grading Company, which took over the mining operation in 1983, discovered buried drums during grading operations. Later that year, approximately 500 drums of solvents and 1000 paint cans, along with contaminated soils were removed by a clean-up contractor for the Lake County Forest Preserve District.

In 1984 Petersen Sand and Gravel was rescored and in the October 15, 1984, Federal Register second proposed update to the NPL.

In 1985, IEPA and USEPA signed a cooperative agreement for the IEPA to perform a Remedial Investigation/Feasibility Study (RI/FS) at the site.

In January, 1986 Planning Research Corporation (PRC) began RI/FS work under contract with the IEPA. Field investigations by the IEPA and USEPA took place between October 1986 and December 1987. A final RI Report was completed in April 1988. Review of the report indicated that contaminants were not present at levels of concern, therefore, a FS was not necessary.

Community Relations History

A Community Relations Plan was developed by the IEPA and finalized in September 1985. In March 1986 after PRC Engineering began RI/FS activities a Fact Sheet was written explaining the site background and the RI/FS process. In 1986 a repository was established at Cook Memorial Library in Libertyville and an informational public meeting was held. The LCFPD and Lake County Health Department (LCHD) have been kept involved and informed throughout the RI. During May and June 1988 meetings were held with the LCHD, LCFPD and Lake County Board to summarize the RI findings and the preferred alternative. On June 13, 1988 the Proposed Plan was distributed and placed into the repository following publication of a brief analysis of the Proposed Plan. This publication also provided notice of the June 21, 1988 Public Hearing and the

period for submission of comments. The Public Hearing was held at the Libertyville Township Hall. A response to comments received during the comment period is included in the Responsiveness Summary. The Administrative Record has been placed in the repository.

Site Characteristics

Site Geology

Two major stratigraphic units have been identified on site: an upper outwash unit underlain by a clay till unit.

The upper outwash unit consists of sand and gravel with interbedded silts and clays. Much of this unit has been removed by mining in the pit area. The clay zone is present in the uppermost part of the outwash unit at elevations of 615 to 640 feet above mean sea level (AMSL) and is continuous over most of the site. This zone thins to the south and southwest and is not present in the area of the sump pond. The clay zone is overlain by a thin layer (less than 15 feet) of sands and gravels which remained after mining operations were completed.

The clay till unit appears to be continuous over the site and seems to be connected to the clay zones in the outwash unit at several locations. The top of this till is at an elevation of approximately 590-600 feet AMSL.

Site Hydrogeology

The hydrogeologic units underlying the site are comparable to the geologic units: outwash aquifer and clay till aquiclude. The outwash aquifer consists of sand and gravel to silty sand with extensive zones of clay. The clay till aquiclude consists of stiff silty clay.

The sump pond is located in the southwest corner of the site where the upper clay zones are absent. Water from the sump pond is pumped nightly into the Des Plaines River at a rate of 1.7 million gallons per night to de-water the pit so that mining can continue. This significantly reduces surface water levels on site which recover during the day as groundwater flows toward the ponds and sump from surrounding aquifer materials. The groundwater flow pattern toward the sump pond reflects the regular pumping of the sump pond. Groundwater elevations on site range from 625 to 628 feet AMSL and the average horizontal hydraulic conductivity in the outwash aquifer was found to be 2.5×10^{-2} cm/sec. The average groundwater flow rate beneath the site was estimated to be 11 feet per year.

Remedial Investigation Summary

The RI included collection of ground and surface water samples, seeps, subsurface DA-3 liquid, surface and subsurface soil samples and sediment samples. See figures for sample locations (Figures 3, 4 and 5). This section summarizes a much more detailed analysis presented in the RI report.

Figure 3
Source: PRC RI (4/4/88)

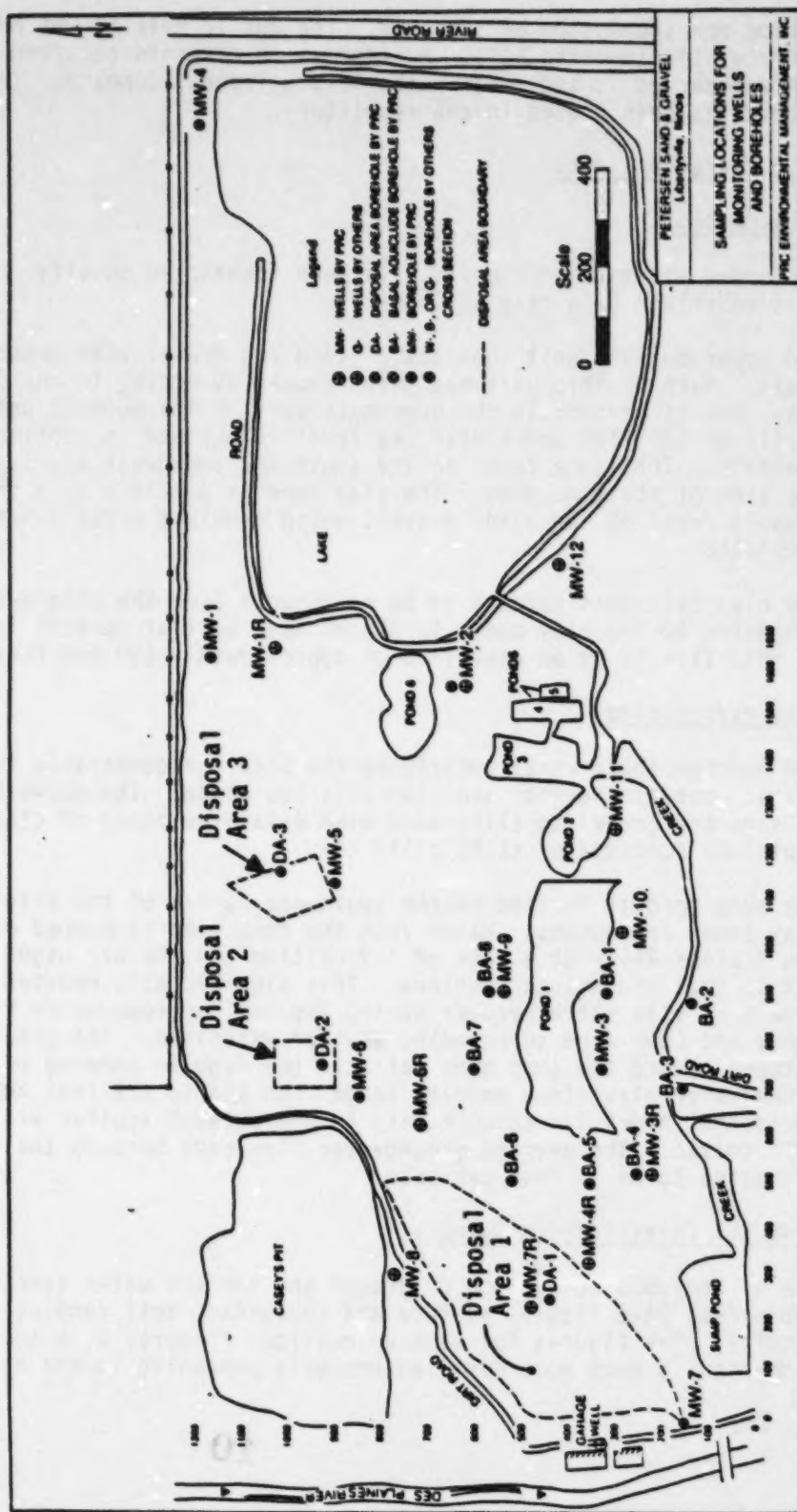
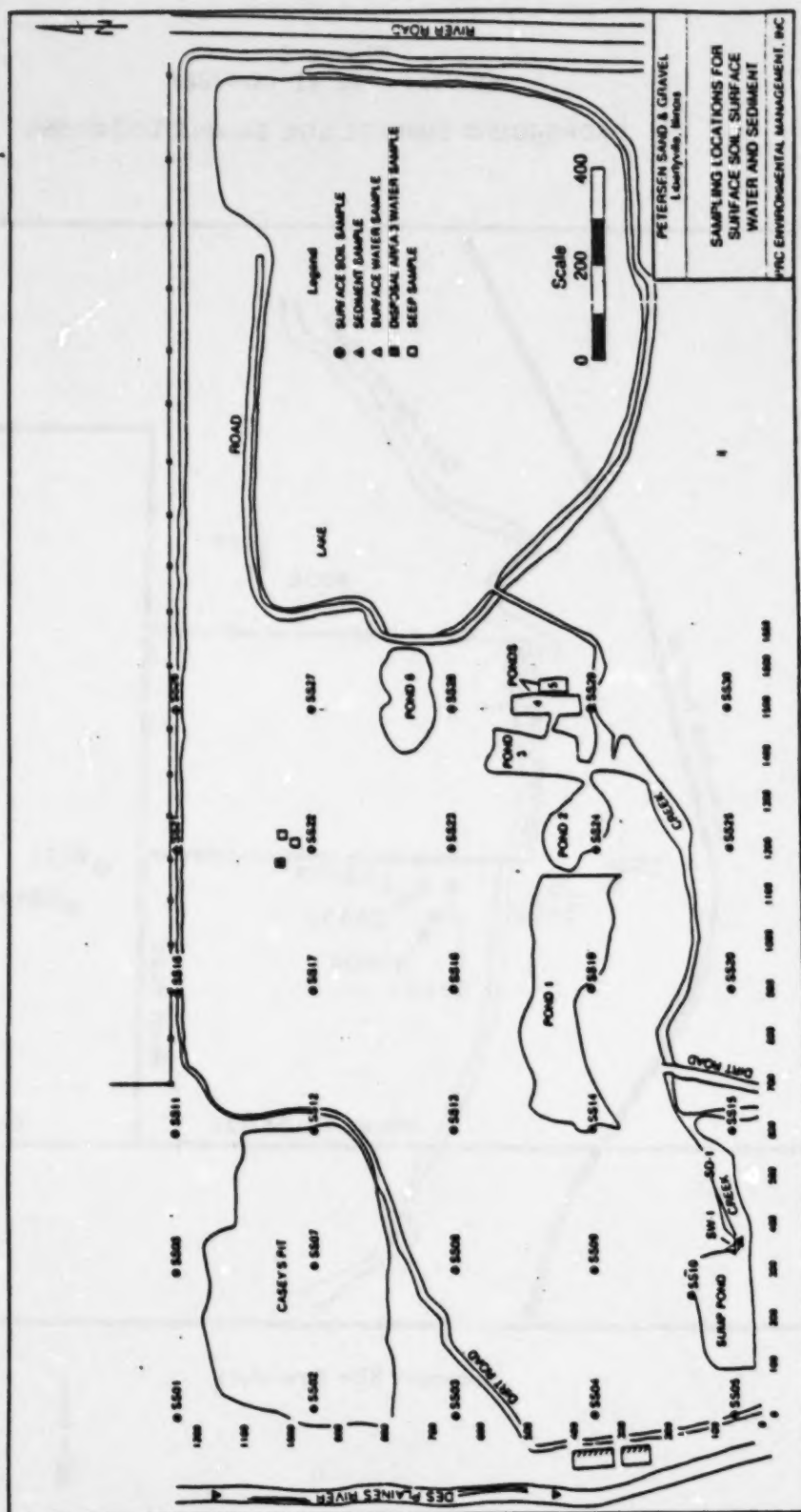


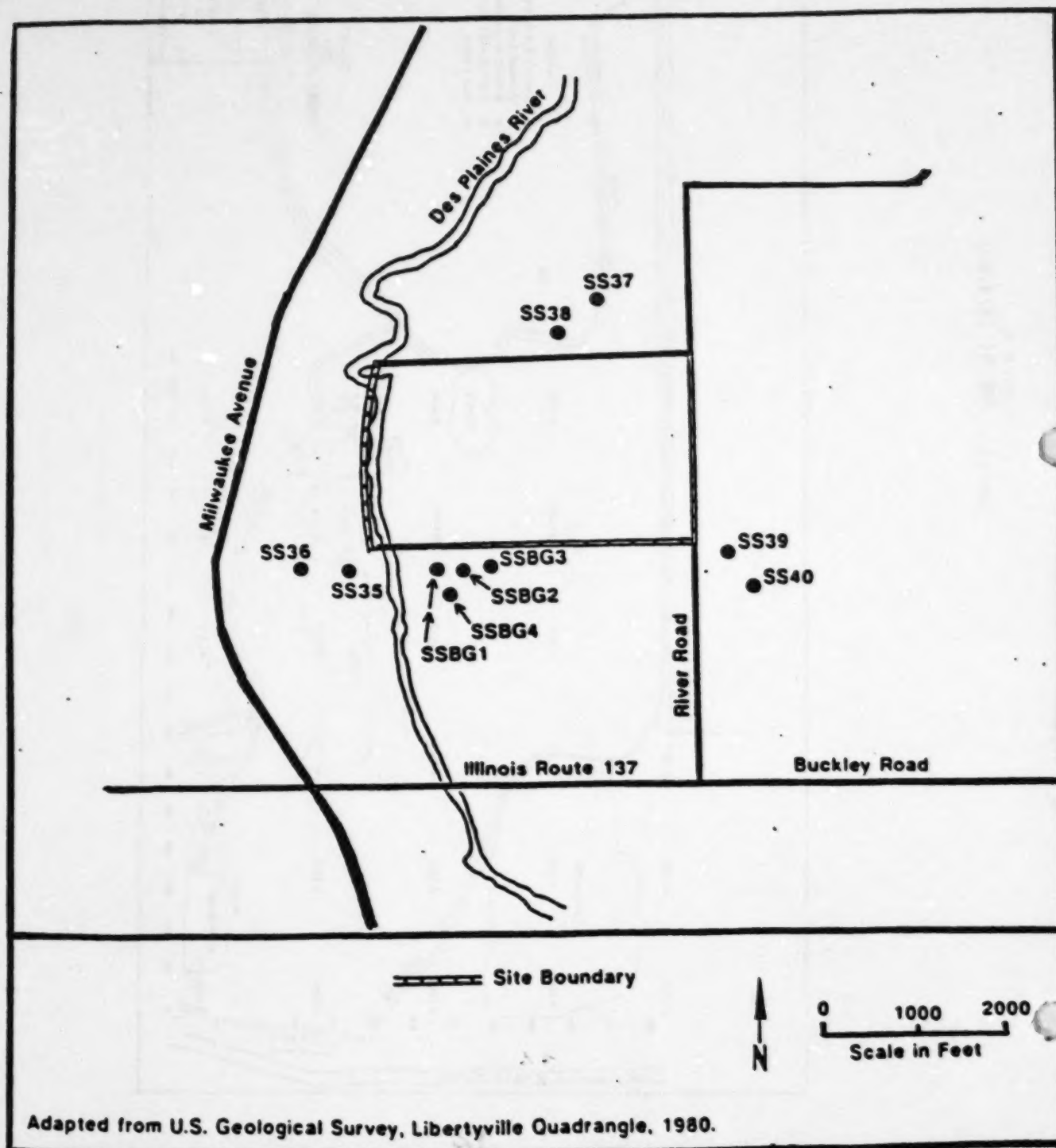
Figure 4
Source: PRC RI (4/4/88)



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Figure 5
Source: PRC RI (4/4/88)

BACKGROUND SURFACE SOIL SAMPLE LOCATIONS



Adapted from U.S. Geological Survey, Libertyville Quadrangle, 1980.

The findings of the RI indicate the following: Geophysical surveys and borings indicate that buried metals remain on site only at disposal area one. Sampling across the site, however, revealed several compounds in soil and water all of which were detected at very low concentrations. Analytical results are summarized below.

A) Groundwater: (See Table 1)

- 1) Groundwater samples were analyzed for over 150 organic and inorganic compounds which make up the Hazardous Substance List (HSL). Of the samples representative of drinking water, only iron and manganese exceeded Federal Secondary Maximum Contaminant Levels (SMCL's) developed for taste and odor. These levels are not health based levels and are also exceeded in groundwater upgradient of the site. The Ambient Water Quality Criteria (AWQC) for nickel in drinking water was slightly exceeded in some samples although no unacceptable risk was calculated using more accurate health effects information. No other contaminants exceeded any established State or Federal standards or criteria for drinking water.

B) Surface Soils: (See Tables 2, 3 and 4)

- 1) Inorganic materials such as aluminum, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, potassium, sodium, titanium, vanadium and zinc exceeded background levels, but none were significantly higher or at levels of concern.
- 2) The family of organic compounds known as polycyclic aromatic hydrocarbons (PAH's) were found in soil samples at low concentrations.
- 3) Low levels of 1,1,1-trichloroethane, tetrachloroethene and toluene, often found in solvents and oils, were found in a limited number of samples.
- 4) Low concentrations of pesticides were found in several locations.
- 5) Polychlorinated biphenyl (PCB) was found in one location at a low concentration.

D. Subsurface Soils: (See Tables 3 and 4)

- 1) The subsurface soil samples from previous disposal areas showed inorganic levels similar to surface soil levels.
- 2) Toluene was found in boreholes and monitoring wells at low concentrations.

E. Surface Water/Seeps:

- 1) Surface seep samples from near DA-3 and a surface water sample from the sump pond showed no significant contamination.

Table 1
Source: PRC RI (4/4/88)

COMPARISON OF SAMPLE CONTAMINANT CONCENTRATIONS
IN THE BACKGROUND WELL TO ON-SITE WELL DATA

<u>Compound</u>	<u>Range of ¹ Background Samples (ug/L)</u>	<u>Range of On-Site Samples (ug/L)</u>	<u>Number of Times Outside Upper Background Range/Number of Times Detected</u>
Aluminum	ND - [108]	ND	0/0
Antimony	ND	ND	0/0
Arsenic	ND - [1.4]	ND - 5.2	4/5
Barium	[20] - [37]	[25] - [80]	4/9
Beryllium	ND	ND	0/0
Cadmium	ND	ND	0/0
Calcium	99,600 - 103,000	10,500 - 304,000	9/11
Chromium	ND	ND	0/0
Cobalt	ND	ND - [17]	4/4
Copper	ND	ND - [13]	5/5
Cyanide	ND	ND	0/0
Iron	[45] - 124	[58] - 3960	10/12
Lead	ND - [1.8]	ND - [3.9]	3/3
Magnesium	72,200 - 84,000	39,000 - 111,000	3/11
Manganese	122 - 128	[8.5] - 695	7/10
Mercury	ND	ND	0/0
Nickel	ND	ND - [24]	6/6
Potassium	[2,710] - 4,140	[2,730] - 5,850	3/10
Selenium	ND	ND	0/0
Sodium	16,400 - 17,800	7,880 - 22,000	4/10
Thallium	ND	ND	0/0
Titanium	ND	ND	0/0
Vanadium	ND	ND	0/0
Zinc	20 - 37	ND - 76	1/9
1,1 Dichloroethene	ND	ND - 2J	1/1
Methylene chloride	ND	ND - 1J	1/1
Toluene	ND - 2J	ND - 3J	1/2
Acetone	ND - 14	ND - 500 B	7/14
2-Butanone	ND	ND - 13	1/1
Di-n-butylphthalate	ND	ND - 3JB	1/1
2-Methylnaphthalene	ND	ND - 4J	2/2
2,4,6-Trichlorophenol	ND	ND - 9J	5/5

COMPARISON OF SAMPLE CONTAMINANT CONCENTRATIONS
IN THE BACKGROUND WELL TO ON-SITE WELL DATA

Notes:

1 Based on two samples

ND - Not detected

If the result is a value greater than or equal to the instrument detection limit but less than the CLP contract required detection limit, the value is listed in brackets (i.e. [1001]).

PRC evaluated only the filtered inorganic sample analysis
n (the number of samples) = 2 for background samples
n (the number of samples) = 10 for remaining samples

PRC evaluated all data from both sampling phases for the organics
n (the number of samples) = 2 for background samples
n (the number of samples) = 20 for remaining samples

Table 2
Source: PRC RI (4/4/88)
COMPARISON OF INORGANIC CONTAMINANT CONCENTRATIONS
IN BACKGROUND AND ON-SITE SOIL SAMPLES
(All results are presented in mg/kg)

Compound	Mean Background Sample ¹	95% Confidence Interval for Mean Background Samples	Maximum Value- All On-Site ² Soil Samples	Maximum Value- On-Site Soil Locations ³ Not Within Proposed Lake
Aluminum	4272	1556 - 11,734	16,400*	9,860
Arsenic	12.06	5.19 - 28.03	20	11.0
Barium	36.6	4.55 - 294.2	164	164.0
Beryllium	0.38	0.18 - 0.82	1.5*	0.82
Cadmium	0.87	0.40 - 1.91	5.8*	1.3
Calcium	104,820	81,781 - 134,350	129,000	95,700
Chromium	6.89	3.56 - 13.33	38*	25*
Cobalt	7.4	3.61 - 15.11	25*	11
Copper	19.49	11.12 - 34.18	55*	27
Iron	17,677	8530 - 36,632	58,600*	20,200
Lead	18.54	10.68 - 32.20	92.7*	92.7*
Magnesium	62.94	50,940 - 77,777	70,800	53,500
Manganese	98	520 - 1550	1920*	1920*
Nickel	19.69	10.34 - 37.5	44*	20
Potassium	735	298 - 1812	2,290*	2000*
Sodium	59.74	1.54 - 2320	317	283
Titanium	215	167 - 276	265	233
Vanadium	15.2	7.59 - 30.38	41*	25
Zinc	69.4	27.54 - 174.93	271*	236*

Notes:

* Indicates those maximum concentrations which exceed the 95 percent confidence interval around the mean measured in background samples.

1 The value presented is a geometric mean of four samples.

2 N = 34 samples: SS-01 through SS-34, SS-01, DA-2-001, DA-3-001, and SD-001

3 N = 8 samples: SS-01, SS-03, SS-04, SS-05, SS-11, SS-16, and SS-26.

Table 3
Source: P. M. I. (4/4/88)
SAMPLE RANGE AND TYPICAL CONCENTRATIONS
OF METALS IN SOIL

Chemical	Typical Range ^a In Soil (mg/kg)	Concentration ^b Range In Soil (mg/kg)	Concentration Range in Background Surface Soils from Petersen Sand and Gravel Site (mg/kg)	Concentration Range in Surface Soils from Petersen Sand and Gravel Site (mg/kg)	Concentration Range in Borehole Soils from Petersen Sand and Gravel Site (mg/kg)
Aluminum	.. ^c	10,000 - 300,000	2,530 - 10,700	1,470 - 16,400	1,390 - 10,700
Antimony	2 - 10	0.2 - 150	ND ^d	ND	ND - 119 (16 of 17-ND)
Arsenic	1 - 50	0.1 - 194	7.8 - 24	3.4 - 20 (1 of 30 - ND)	2.8 - 12
Barium	100 - 3,000	100 - 3,000	11 - 187	7.3 - 164	4.7 - 99
Beryllium	0.1 - 40	0.1 - 40	0.28 - 0.78	0.25 - 1.1 (4 of 30 - ND)	0.23 - 1.5 (3 of 17 - ND)
Cadmium	0.01 - 0.7	0.01 - 7	ND - 1.7 (1 of 4 ND)	0.86 - 2.7 (22 of 30 - ND)	0.72 - 5.8 (14 of 17 - ND)
Calcium	..	..	89,800 - 130,000	2,720 - 129,000	11,200 - 151,000
Chromium	1 - 1,000	5 - 3,000	4.4 - 12	4.1 - 25	1.6 - 38
Cobalt	1 - 40	0.05 - 65	4.5 - 13	2.7 - 23	3 - 25
Copper	2 - 100	2 - 250	16 - 33	9.2 - 55	7.8 - 45
Cyanide	..	..	ND - 12.2 (3 of 4 ND)	ND	ND
Iron	..	1000 - 550,000	12,500 - 33,800	7,860 - 58,600	9,010 - 62,000
Lead	2 - 200	<1 - 888	15 - 31	4.2 - 92.7	5.3 - 84
Magnesium	..	..	56,000 - 74,500	1,620 - 70,800	7,580 - 67,500
Manganese	20 - 3,000	20 - 18,300	575 - 1,300	413 - 1,920	394 - 2,020
Mercury	..	..	ND - 0.048 (3 of 4 - ND)	ND	ND
Nickel	5 - 500	0.1 - 1,530	14 - 35	4.8 - 44 (1 of 30 - ND)	ND - 34 (1 of 17 - ND)
Potassium	..	..	490 - 1710	222 - 2,290	393 - 2,540 (1 of 17 - ND)
Selenium	0.1 - 2.0	0.1 - 36	ND	ND	ND - 1.2 (16 of 17 - ND)
Silver	0.01 - 5	0.01 - 8	ND - 1.7 (3 of 4 ND)	ND	ND - 26 (16 of 17 - ND)
Sodium	..	..	1.95 - 271	26 - 317	136 - 285
Thallium	..	..	0.34 - 0.82	ND	ND
Titanium	..	..	176 - 256	61 - 265	15 - 229
Vanadium	20 - 500	3 - 500	11 - 29	5.7 - 30	5.4 - 41
Zinc	10 - 300	1 - 2,000	38 - 135	25 - 271	13 - 147

Notes:

^a Source: U.L. Lindsay, 1979. Chemical Equilibrium In Soils.

^b Sources: N.J.M. Bowen, 1979. Environmental Chemistry of the Elements. URE, A.M., and others, 1983. Environmental Chemistry. Parr, J.F., P.B. Marsh, and J.M. Kie, 1983. Land Treatment of Hazardous Wastes.

^c Indicates data not available.

^d ND indicates not detected.

Table 4

Sample Range of Organics in Soil
Source: PRC RI (4/6/88)

Organic Compounds	Concentration Range in Surface Soils from Petersen Sand and Gravel Site		Concentration Range in Waste Area Borehole Soils from Petersen Sand and Gravel Site		Concentration Range in main well Borehole Soils from Petersen Sand and Gravel Site	
	ug/kg		ug/kg		ug/kg	
Volatiles						
1,1,1-Trichloroethane	49-130(27 of 30-MD)				2-3(5 of 8-MD)	
Methylene Chloride	4-32(20 of 30-MD)		2-15(1 of 18-MD)		1-17(1 of 8-MD)	
Tetrachloroethene	2-5(27 of 30-MD)		1 (17 of 18-MD)		2-4(5 of 8-MD)	
Toluene	2-56(22 of 30-MD)		4-290		8-120(4 of 8-MD)	
Trichloroethene	2-5(25 of 30-MD)				7-35	
Acetone	6-110(24 of 30-MD)		5-17			
2-Butanone	6-21(20 of 30-MD)				12(7 of 8-MD)	
4-Methyl-2-Pentanone			2(17 of 18-MD)			
Ethylbenzene			8(17 of 18-MD)			
Total Xylenes			17(17 of 18-MD)			
Acids						
4-Methylphenol			500(17 of 18-MD)			
Benzoic Acid	24-730(16 of 30-MD)					
Base/Neutrals						
Bis(2-Ethylhexyl)						
Phthalate						
Di-N-Butyl-Phthalate	490-590(28 of 30-MD)		100(17 of 18-MD)		160(7 of 8-MD)	
Fluoranthene	100-120(26 of 30-MD)		62-200(14 of 18-MD)		80-430(4 of 8-MD)	
Benzo(a)Anthracene	150-690(25 of 30-MD)					
Benzo(a)Pyrene	110-280(27 of 30-MD)					
Benzo(b)Fluorethene	94-250(27 of 30-MD)					
Benzo(k)Fluoranthene	130-250(27 of 30-MD)					
Chrysene	180-190(28 of 30-MD)					
Anthracene	100-340(26 of 30-MD)					
Phenanthrene	120(29 of 30-MD)					
Pyrene	170-420(26 of 30-MD)					
Benzyl Alcohol	100-520(25 of 30-MD)					
	140-310(28 of 30-MD)					
Pesticides and PCBs						
Dieldrin	75(29 of 30-MD)					
4,4-DDE	6.7-8.4(27 of 30-MD)					
4,4-DDD	3.5-5.1(27 of 30-MD)					
4,4-DDT	5.4-31(27 of 30-MD)					
Aroclor-1248	450(29 of 30-MD)					

Notes:

(7) of 30-MD) = The compound was not detected in 27 of a total of 30 samples which were analyzed for the compound.

F. Sediment:

- 1) A sediment sample from the sump pond showed no significant contamination.

G. Subsurface DA-3 Liquid:

- 1) The liquid sample from an 11 foot depth at DA-3 contained low levels of benzene and xylene.

Based on the data review, the Petersen Sand and Gravel site has levels of contamination that exceed background levels in both soil and surface water, and to a lesser extent, the groundwater.

Endangerment Assessment

The contaminants identified by investigations were evaluated to determine the level of risk to public health and the environment.

The following six exposure scenarios were evaluated to determine the level of risk for present use of the site:

- 1) Ingestion of contaminated soils by trespassers on the site.
- 2) Direct contact with contaminated soil by trespassers.
- 3) Inhalation of contaminated air by trespassers and off-site residents.
- 4) Ingestion of contaminated groundwater by people.
- 5) Ingestion of contaminated surface water on-site by people.
- 6) Direct contact with and incidental ingestion of contaminated surface water on site by aquatic life.

The following exposure scenarios were also evaluated to determine the level of risk if a recreational lake were developed:

- 1) Ingestion of contaminated soil by people using the proposed lake recreational area.
- 2) Direct contact with contaminated soil by people using the proposed lake.
- 3) Direct contact with or ingestion of contaminated surface water in proposed lake by aquatic life.
- 4) Ingestion of contaminated aquatic life from the proposed lake by humans.

Table 5
Source: PRC RI (4/4/88)

SUMMARY OF TOTAL INCREMENTAL CARCINOGENIC RISKS FOR
THE PETERSEN SAND AND GRAVEL SITE -- BY EXPOSURE PATHWAY
UNDER THREE SITE USE CONDITIONS
(Page 1 of 4)

Exposure Pathway	Exposed Population	Incremental Carcinogenic Risk Summation		Source Table	Comments
		Present Use	Worst Case Probable Case		
Ingestion of Soils	Children 6 to 12 years of age trespassing on the site.	5E-07	2E-08	6-9	The largest contributors to the total incremental carcinogenic risk for this pathway are: worst case -- PCBs (2E-07) and Benzopyrene (2E-07) and probable case -- PCBs (1E-08) and Benzo(a)pyrene (1E-08).
Direct Contact with Soils	Children 6 to 12 and adults 13 to 45 years of age trespassing on the site.	1E-09	7E-10 (2E-09) ^c	6-13	The largest contributors to the total (child plus adult exposure) incremental carcinogenic risk for this pathway are: PCBs (8E-10); Benzo(a)pyrene (7E-10); and Benzo(b)k fluoranthene (2E-10).
Inhalation of Particulates and Volatiles	Children and adults 6 to 45 years of age trespassing on the site and children and adults 1 to 70 year of age living near the site.	3E-09	.	6-17	The largest contributors to the total incremental carcinogenic risk for this pathway are: nickel (2E-09); cadmium (8E-10); and beryllium (1E-10).

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Source: PKC RI (4/4/88)

SUMMARY OF TOTAL INCREMENTAL CARCINOGENIC RISKS FOR
THE PETERSEN SAND AND GRAVEL SITE -- BY EXPOSURE PATHWAY
UNDER THREE SITE USE CONDITIONS
(Page 2 of 4)

Exposure Pathway	Exposed Population	Present Use	Incremental Carcinogenic Risk Summation		Source Table	Comments
			Worst Case	Probable Case		
Ingestion of Ground Water	Children and adults 1 to 70 years of age ingesting water from wells located near the site.		2E-04	..	6-19	The largest contributors to the total incremental carcinogenic risk for this pathway are: arsenic (2E-04) and 1,1-Dichloroethene (3E-05). (Note: carcinogenic risk is based on samples from on-site monitoring wells. Actual risks associated with off-site wells may be lower.
Direct Contact with Surface Water	Children and adults 6 to 45 years of age trespassing on the site and children and adults 1 to 70 years of age living near the site.		..	..	MA	A single surface water sample from the on-site sump pond showed only 3 inorganics that exceeded secondary maximum containment levels (iron, manganese, and sulfate) and no organics.

Total 2E-04

Table 5
Source: PRC RI (4/4/88)

SUMMARY OF TOTAL INCREMENTAL CARCINOGENIC RISKS FOR
THE PETERSEN SAND AND GRAVEL SITE -- BY EXPOSURE PATHWAY
UNDER THREE SITE USE CONDITIONS
(Page 3 of 4)

Exposure Pathway	Exposed Population	Incremental Carcinogenic Risk Summation		Source Table	Comments
		Future Use -- Proposed Recreational Lake	Worst Case -- Probable Case		
Direct Contact with Surface Water	Children 1 to 70 years of age	..	..	NA	Exposure is expected to be minimal. No surface water samples taken from the Des Plaines River near the site. Analysis of water pumped into the river from the on-site sump ponded into the river from the on-site pond showed no organics.
Ingestion of Aquatic Life	Children and adults 1 to 70 years of age who consume fish from the proposed recreational lake.	..	2E-07	6-6	The largest contributors to the total incremental carcinogenic risk from this pathway are: DDT (1E-07); benzo(b-k)fluoranthene (4E-06); and DDD (3E-08).
Ingestion of Solids	Children 1 to 12 years of age visiting the site.	2E-06	4E-07	6-10	The largest contributor to the total incremental carcinogenic risk from this pathway under probable case conditions is PCBs (4E-07); under worst case conditions is PCBs (2E-06).
Direct Contact with Solids	Children and adults 1 to 70 years of age who visit the proposed recreational lake	4E-09	1E-09 ^d (5E-09)	6-15	The largest contributors to the total (child plus adult exposure) incremental carcinogenic risk for this pathway are: PCBs (5E-09); DDE (4E-12); and DDD (3E-12).

Table 5
Source: PRC RI (4/4/88)

SUMMARY OF TOTAL INCREMENTAL CARCINOGENIC RISKS FOR
THE PETERSEN SAND AND GRAVEL SITE -- BY EXPOSURE PATHWAY
UNDER THREE SITE USE CONDITIONS
(Page 4 of 4)

Exposure Pathway	Exposed Population	Incremental Carcinogenic Risk Summation		Source Table	Comments
		Future Use -- Proposed Recreational Lake	Worst Case Probable Case		
Inhalation of Particulates and Volatiles	Children and adults 1 to 70 years of age visiting the site or living near the site.	1E-08	--	6-18	The largest contributor to the total incremental carcinogenic risk for this pathway is nickel (1E-08).
Ingestion of Ground Water	Children and adults 1 to 70 years of age ingesting water from wells located near the site.	2E-04	--	6-19	The largest contributors to the total incremental carcinogenic risk for this pathway are: arsenic (2E-04) and 1,1-dichloroethene (3E-05). [Note: carcinogenic risks are based on samples from on-site monitoring wells. Actual risks associated with off-site wells may be lower.]

Total 2E-04

Future Use - No Recreational Lake

Incremental carcinogenic risks are the same as described above under present use with the following change concerning ingestion of groundwater: In the future groundwater wells may be completed on site. In this case, the total incremental carcinogenic risk described above for ingestion of groundwater (based on the results from on-site monitoring wells) accurately reflects anticipated conditions.

-- not calculated
NA not applicable

- a The incremental carcinogenic risk summation is the sum of the individual compound specific incremental carcinogenic risks (presented in the Source Tables -- see footnote d) calculated for each compound which met the selection criteria described in Section 6.1 for the medium of concern.
b These tables contain the individual exposure pathway and compound specific exposure doses, potency factors and incremental carcinogenic risks.
c The incremental carcinogenic risks (ICR) presented for the direct contact with soils pathway represent the ICR for adults (1E-09), the ICR for children (7E-10), and the ICR for adults and children combined (2E-09).
d The incremental carcinogenic risks (ICR) presented for the direct contact with soils pathway represent the ICR for adults (4E-09), the ICR for children (1E-09), and the ICR for adults and children combined (5E-09).

In summary, the endangerment assessment concluded that exposure to contaminants at or released from the Petersen Sand & Gravel site present a very minimal risk to human and aquatic life. There were no unacceptable noncarcinogenic or carcinogenic, present or future risks to the public health (see Table 5).

The results of the sampling of surface and subsurface soils, groundwater and surface water as well as sediment from a sump pond revealed low levels of contaminants. The endangerment assessment indicated that there is a very limited or minimal risk to the public health and the environment.

Documentation of Significant Changes

There are no significant changes from the preferred alternative described in the Proposed Plan.

The Selected Remedy

The findings of the RI show that the previous removal actions were adequate to protect human health and the environment, and that no unacceptable risk remains at the site. Therefore, no further action is recommended at the Petersen Sand and Gravel site.

Although the RI report concluded that development of a recreational lake should not pose any unacceptable risks, it is impossible to fully predict future conditions when a lake is developed on the site. In order to ensure the safety of aquatic life and future users of the lake, it is recommended that surface water and sediments be monitored before and after the lake is in place. A plan for this monitoring is being developed by Lake County.

Groundwater and precipitation which collects in the pit is currently being discharged from a sump pond to the Des Plaines River to prevent water from filling the pit so that mining can continue. This discharge will be monitored under IEPA's National Pollution Discharge Elimination System (NPDES) permit program to ensure that contaminants are not released to the river. The monitoring requirements for this permit are currently under review by IEPA.

Statutory Determinations

Cost effectiveness and utilization of permanent solutions and alternative treatment technologies, are not applicable to the no further action alternative.

Protection of Human Health and the Environment

Because this remedy will not result in hazardous substances remaining onsite above health-based levels, this remedy is protective of human health and the environment. The U.S. Environmental Protection Agency, Illinois Environmental Protection Agency, and the Illinois Department of Health concur with the assessment that the site poses no unacceptable risk to human health and the environment.

Compliance with applicable, or relevant and appropriate, State and Federal requirements.

Iron and manganese in some groundwater samples including groundwater which has not been affected by the site, exceeded the Federal SMCL's for drinking water. These SMCL's are intended as guidelines for the State in their oversight of Public Water Systems and are not intended to be Federally enforceable. The AHQC for nickel in drinking water was exceeded in some samples, however, no unacceptable risk was estimated by the Endangerment Assessment. No other Federal or State environmental standards or criteria are exceeded at the site.

ATTACHMENT II

Community Relations Responsiveness Summary
Petersen Sand and Gravel Site
Libertyville, Illinois
July, 1988

The purpose of this community relations response summary is to document milestone community relations activities along with citizen comments and questions and Agency responses. The Illinois Environmental Protection Agency has been responsible for conducting a coordinated community relations program for this site. Community relations activities have been administered throughout the Remedial Investigation and the presentation of the alternative. In accordance with CERCLA Section 117, a seven week public comment period, informal meetings and a public hearing were held to acquire public comment.

The selected remedy of no further action was presented in the June, 1988 Proposed Plan and at the public hearing. There has been no negative public reaction to the selected remedy before or during the comment period and Lake County officials have indicated their agreement with the Agencies decision.

COMMUNITY RELATIONS

Remedial Investigation (RI)

A community relations plan was submitted to and approved by the United States Environmental Protection Agency (USEPA) in September, 1985. During the initial assessment citizen concerns regarding the site were identified and addressed. The major concerns seemed to come from county officials and efforts have been made to maintain coordination between IEPA and county government agencies through one-to-one contacts and informal meetings.

Milestone community relations activities conducted during the remedial investigations include:

- Developed a formal procedure for responding to citizen inquiries
- Informal meetings with county officials
- Established and maintained an information repository
- Press releases, media contacts and public meetings

Hearing Process

The dates of the public comment period, the date and the location of a public hearing and a summary of the Proposed Plan were announced through a legal notice in two area newspapers.

The Petersen Proposed Plan, which includes a description of the investigation findings and conclusions, was mailed to those on the community relations mailing list and was available along with the Administrative Record at the Lake/Cook Memorial Library in Libertyville. Before the public hearing, five meetings were held with interested groups which included four meetings with county officials and one meeting with the news media.

The public hearing was held at the Libertyville Township Hall at 359 Merrill Court on Tuesday, June 21, 1988 to discuss the Remedial Investigation and the preferred alternative. Approximately one dozen people were at the hearing. Following presentations by IEPA and their contractor, only one county official expressed comments.

Comments raised during the public comment period, which are relevant to the Proposed Plan, are summarized below. The comment period was held from May 23 to July 12, 1988.

SUMMARY OF PUBLIC COMMENTS AND AGENCY RESPONSE

Question: What is the extent of contamination found in the soil at the site and the risks associated with the soil and proposed lake?

Low concentration levels of contamination were found in all three disposal areas as well as at other locations in the grid area. Inorganic and some organic chemicals such as polycyclic aromatic hydrocarbons (PAH's) occur naturally in the soils. By a comparison of background levels near the site with on site levels, inorganic chemicals were not significantly higher. However, other organic chemicals such as PCB, pesticides and solvents as well as inorganic chemicals were at levels that present a minimal or small risk to the public health and the environment including the proposed lake.

As part of the Endangerment Assessment in the Remedial Investigation modelling was done to estimate the concentrations of contaminants that would be released to the proposed lake. The estimates indicate that concentrations would be low enough to present minimal risk to public health and the environment.

Question: Why was the RI done?

A preliminary assessment and site inspection was done by the USEPA and the site scored high enough by the Hazardous Ranking System to be placed on the Superfund Program National Priorities List (NPL). Under the law, sites on the NPL must, at a minimum, undergo a RI to determine whether conditions warrant remedial action.

Question: How did we know that no more drums exist at the site?

Soil borings were conducted at the three disposal sites and 23 other locations and subsurface surveys to determine the existence of metal drums under the site were conducted over a 20 acre grid. Results of these investigations do not indicate the presence of buried drums.

Question: Why was the east side of the pit also studied?

A study area of approximately 20 acres was chosen to include three known waste disposal areas as well as adjacent areas with unknown past activities. This was necessary to determine whether other areas were affected by known waste areas and whether unknown wastes were present since very little is known about past operations at the site.

Question: How do we know that the sand and gravel operation north of the site has not caused the site contamination?

It is known that paint, paint waste and solvents have been illegally landfilled at the Petersen pit and several drums of waste have been removed. No illegal waste disposal activities are known to have occurred at the sand and gravel operation to the north, therefore, no wastes are present which would be released.

The Petersen pit is on the east side of the Des Plaines river while the northern operation is on the west. If contaminants existed at and were released from the northern operation they would have to migrate through the river to affect the Petersen site. There is no evidence that this has happened.

Question: Who will do the post-RI monitoring?

Since the post monitoring of surface water is to ensure protection if a recreational lake is developed, the monitoring does not directly deal with this Superfund project goals and objectives. The County has agreed to do monitoring before, during, and after the proposed lake is developed to ensure that there is no adverse impact to the public health and the environment.

BM:2250j,1,3

ATTACHMENT III

INDEX OF THE ADMINISTRATIVE RECORD

- . Preliminary Assessment Report (PA)
- . Site Investigation Report (SI)
- . Removal Documents (Chemical Waste Management report)
- . QA/QC Data from Laboratory (at IEPA, LPC files)
- . Data Summary Sheets (Refer to Remedial Investigation)
- . Health and Safety Plan
- . Quality Assurance Project Plan (QAPP)
- . RI/FS Work Plan
- . Summary of changes to Work Plan
- . Changes in Scope of Work (Memos)
- . Remedial Investigation (RI)
- . Community Relations Plan
- . Response to Public Comment - Responsiveness Summary
- . Transcript of Public Meeting
- . Record of Decision (ROD)
- . Amendments to ROD (if applicable)
- . Pollution Control Board Opinion and Order
- . Court Order